Iowa
Agricultural Education
Competency Lists

June 1999

Validated/Minimum Competencies
for educational programs in the areas of:

Agricultural Business, Service and Supply
Agricultural Production
Agricultural Mechanics
Horticulture
Agricultural Products and Processing
Natural Resources

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Introduction

This document is a compilation of minimum competencies to be included in the study of the seven occupational areas of agriculture at the secondary school level: Agricultural Sales & Service, Agricultural Production, Agricultural Mechanics, Horticulture, Agricultural Products & Processing, Forestry, and Conservation & Natural Resources. In this document, we have combined Forestry and Conservation & Natural Resources under one title of Natural Resources. Also, the terms Agricultural Business has been added to the terms Service & Supply. One of the lists is entitled "Technology". The items in this list can be a part of each of the other areas.

The reader should note that these lists consist of MINIMUM competencies. This document is NOT a compilation of all the knowledge and skills to be learned in each occupational area. Local program content and delivery are dependent on inputs from learners, teachers, advisory councils, parents, employers and other stakeholders.

The competencies listed in this document have been identified and validated by leaders and professionals in each of the occupational areas. The latest validation process was conducted in 1999.

Readers should use this updated list as a source for guidance in constructing their curriculum guides for secondary school programs in agriculture.

Natural Sciences

Occupational

1. Identify a minimum of five (5) environmental and natural resource occupations and explain the job requirements, major activities performed by persons in these occupations and availability by location.
2. Explain the connection between the natural resources occupations, agribusiness, and technology.
3. Explain the impact agriculture, industry, and population centers have on natural resources and the environment.
4. Use soil survey, topography maps, aerial photos, and other natural resources Inventories to interpret, compare (limits and potentials), and plan wise land management.
5. Identify federal, state, and local regulations related to soil and water conservation, water quality, forestry, air quality, and wildlife. Explain their applicability to resource management.
6. Write a legal description of a selected piece of land.
7. Locate a plot of land given a legal description.
8. Explain basic soil morphology and its relationship to management.
9. Demonstrate general computer literacy, word processing, information gathering, and database operation.
10. Describe the types of wind and water erosion and determine soil erosion rates and resulting economic and environmental losses to society.
11. Select appropriate conservation practice that will reduce erosion and improve water quality on a farm and urban area.
12. Evaluate alternative agricultural systems based on productivity, profitability, environmental considerations, and social acceptance.
13. Develop an individual resource conservation plan to include crop, pasture, woodlands, wildlife, farmstead, and urban considerations.
14. Measure and calculate land area, length, and percent slope.
15. Determine soil amendments necessary based on soil tests, realistic yield goals, and the fertility level of a given piece of land.
16. Identify and evaluate conservation tillage systems and their productivity, profitability and environmental impact.
17. Explain the techniques of crop cultivation and how they interrelate with the environment.
18. Identify a minimum of 50 plants by their common name.
19. Evaluate benefits and uses of native plants and animals as well as their negative uses.
20. Explain the role of test plots in evaluating agricultural management practices.
21. Explain the hydrologic cycle.
22. Identify local sources of water for public, home, industrial, recreational and agricultural uses.
23. Identify primary sources of ground and surface water contamination and explain techniques for protecting these resources.
24. Explain the importance of protecting ground and surface water resources.
25. Evaluate means of solving local water resource problems.
26. Collecting, understanding, and analyzing samples to assess water quality and analyze findings.
27. Estimate water needs for a community and farm operation.
28. Evaluate various solid waste disposal systems by their environmental impact.
29. Identify techniques for improvement of aquatic habitats.
30. Identify a minimum of 10 aquatic plants and 10 aquatic animals common to Iowa.
31. Develop a wildlife management plan for a given area.
32. evaluate means of solving local wildlife resource problems.
33. Identify types of hunting leases and liability involved.
34. Determine crops and crop management that will provide habitat for wildlife.
35. Perform wildlife habitat improvements. Be knowledgeable of wildlife habitat technologies.
36. Identify a minimum of 30 Iowa wildlife species to include game, non-game, and endangered species.
37. Explain a minimum of 5 timber stand improvement practices.
38. Identify woodland changes caused by pests and fire.
39. Explain important principals and economic values in managing trees for wood products, Christmas tree production, wildlife, recreation, windbreak, water recycling, air pollution, and energy.
40. Evaluate means of solving Iowa forest resource problems.
41. Identify a minimum of fifteen (15) Iowa tree species and their common uses and planting objectives.
42. Demonstrate the proper planting of a tree based on soil conditions, size conditions, and land use objectives.

43. Describe how Iowa climate and weather is relevant to natural resources and agricultural resource management.
44. Evaluate alternative solutions to Iowa air pollution problems.
45. Read manuals and labels to properly use agricultural equipment, chemicals, and other agricultural inputs correctly and safely.
46. Explain the principles of integrate crop (fertility levels, pests) management.
47. Identify contemporary natural resources issues/concerns relating to agriculture.
48. Explain proper stocking and management of farm ponds.
49. Explain current issues involved in natural resource management.
50. Explain harvest management techniques and regulations.
51. Describe global environmental impact.
52. Explain global positioning systems and graphic information systems and understand practice application.
53. Operate office equipment (e-mail, fax, phone innovations, etc.).
54. Describe current animal waste regulations as they apply to the environment.
55. Explain State and Federal AG and Natural Resource Management Agencies and their functions.
56. Identify the role geologic resources have in land use planning.
57. Evaluate and incorporate alternative fuel resources.
58. Explain the economic impact of the loss of wildlife, habitat, urban sprawl, and navigation on wildlife resources.
59. Identify the agricultural impact of groundwater resource availability, management, and use.
60. Select alternative grazing practices to eliminate grazing of woodlands.
61. Identify alternative forest management practices that reduce "high grading" of timber harvest.
62. Describe the connections between land use, rural Iowa, and agriculture.
63. Develop plans which incorporate the use of federal, state, and local agriculture programs to sustain resources (i.e., buffer strips).
64. Incorporate wildlife depredation prevention into animal husbandry practices.
65. Assess and implement BMPs (Best Management Practices) related to agriculture drainage wells, erosion control, irrigation of wastewater, irrigation of groundwater, use of storage tanks (i.e., fuels, Anhydrous Ammonia, etc.) and wellhead and source of water protection which improve water quality.
66. Identify and incorporate nutrient management practices including spreading lagoon fertilizers, commercial applicator training, composting of manure and animal carcasses, managing wastes from food processing facilities through composting, developing manure management plans, the application of municipal sludge, and the storage, handling, and transfer of chemicals into agricultural plans.
67. Identify BMPs (Best Management Practices) for proper asbestos removal from agriculture facilities.
68. Identify BMPs (Best Management Practices) for management of solid wastes from agriculture facilities (i.e., reduce burning and on-site disposal).
69. Identify BMPs (Best Management Practices) for the management of vehicular wastes (i.e., oil antifreeze, lead batteries, tires, etc.).

Leadership

1. Listen effectively.
2. Follow directions.
3. Manage conflict (personal and customer).
4. Prioritize a series of tasks.
5. Utilize time effectively.
6. Speak effectively in front of others.
7. Work effectively with others.
8. Define goals.
9. Delegate duties.
10. Adapt to environment/situation.
11. Facilitate group interactions (teamwork).
12. Lead a discussion.
13. Organize an event.
14. Become personally involved in a professional organization.

Job Getting, Job Keeping

1. Identify skills, physical and emotional requirements for a job.
2. Complete required forms.
3. Construct an application letter.
4. Evaluate job offer, benefits, time, and working environment.
5. Interact with others in a courteous and tactful manner.
6. Cooperate with others.
7. Accept individual differences.
8. Respect the property of others.
9. Organize thoughts and clearly express point of view.
10. Organize thoughts and write clearly.
11. Exhibit dependability/responsibility on the job.
12. Demonstrate punctuality.
13. Ask for help when needed.
14. Accept new challenges.
15. Demonstrate initiative.
16. Accept supervision willingly.
17. Adapt to change/demonstrate flexibility.
18. Manage time effectively.
19. Follow rules and regulations.
20. Produce quality work.
21. Work within guidelines.
22. Take responsibility for mistakes and/or good work.
23. Comply with safety and health rules.
24. Utilize equipment correctly as shown/demonstrated by a supervisor.
25. Compose a resume.
26. Maintain clean and orderly work area.
27. Demonstrate personal hygiene and cleanliness.
28. Explain the relationship between public and private sectors.
29. Explain the concept of competition.
30. Analyze the concept of supply and demand.
31. Explain the concept of organized labor and business.
32. Explain the concept of business cycles.
33. Explain the nature of international trade.
34. Explain the concept of profit.
35. Demonstrate proper telephone etiquette.

Entrepreneurship

1. Analyze business organizations.
2. Identify skills required of a business owner. Recognize relevant, ethical issues in business.
3. Recognize relevant, ethical issues in business.
4. Identify the personal characteristics of entrepreneurs.
5. Analyze the contents of a business plan.
6. Recognize the importance of technical assistance.
7. Explain types of business ownership.
8. Identify factors in obtaining finances for a new business.
9. Demonstrate the ability of market analysis.
10. Develop positive community relations.